REMARKS

Claims 1, 3-6 and 9 are all the claims pending in the application. Claims 1, 5, 6 and 9 are amended. Claim 2 is cancelled. New claim 10 is added.

In amended claim 1, "a soft magnetic layer of a material selected from a group consisting of an Fe-based material and a Co-based material" is based on the description of page 11, lines 6-7 of the instant specification.

In amended claim 1, "a layer, on said ferromagnetic layer, comprising a material selected from a group consisting of CoCrPt, CoPt, CoPd, FePt, $CoPt_3$, and $CoPd_3$" is based on the description of page 8, lines 1-3 from the bottom of the instant specification. (It is strictly confidential that the client of this application actually uses a single layer comprising CoCrPt, CoPt, CoPd, FePt, $CoPt_3$, or $CoPd_3$ instead of the stacked layer.)

In amended claim 1, "the content of the silicon (Si) in said ferromagnetic layer being 6at% or more" is based on the description of the original claim 3.

The amended portions of claims 5, 6 and 9 are based on the above-mentioned description identified for amended claim 1.

New claim 10 is based on the description of page 9, lines 12-13 of the original specification.

Claim Rejections - 35 USC § 102

Claims 1 & 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Kikitsu et al. (US 2003/0017364). This rejection is traversed for at least the following reasons.

Claim 1

As to Claim 1, in the Response to Arguments, the Examiner states that Kikitsu clearly meets the limitations of the claim, particularly with respect to Figure 1, where there is "a substrate (layer 13, Paragraph 50), the use of underlayers (applicant's soft magnetic layer on substrate) (Paragraph 87-88), cobalt crystals (Paragraph 67, 89-91), alloy systems that would include silicon and or an oxide of silicon (Paragraph 78), and layers comprising Pd and/or Pt (Paragraph 67-68) and teaches the addition of at least one element selected from Co, Pt, Pt added to the nonmagnetic spacer layer (reading on second layer comprising Pd or Pt (Paragraph 143)." The Examiner further finds the use of ferromagnetic materials in the functional layer, with reference to paragraph 72-75.

Applicants have amended the claim to further emphasize the structure of the invention in solving unique problems that are not considered by Kikitsu et al.

The Problem Solved by the Invention

A first problem is described at page 3, line 16 through page 4, line 3 of the original specification:

"By adding an oxide such as SiO_2 to the CoPt-based perpendicular magnetic recording layer, the oxide such as SiO_2 is segregated at the grain boundaries to reduce the magnetic interaction between the crystal grains of the magnetic recording layer. Further, by the addition of the oxide such as SiO_2, the crystal grain size can be reduced. By increasing the amount of SiO_2 added to the magnetic recording layer, the S/N ratio in high density recording is improved."

A second problem is described at page 4, lines 4-21 of the original specification:

"However, when aiming at a medium adaptable to 400Gbit/inch^2 or more, it is difficult to produce the medium excellent in thermal stability or recording properties only by adding the oxide such as SiO_2. That is, when, for example, the amount of SiO_2 is increased to 6at% or more, degradation occurs in coercive force Hc. Due to such reduction in coercive force Hc, the thermal stability degrades and the DC noise increases. On the other hand, as the amount of SiO_2 increases, the SNR (SN Ratio) becomes better."

The Solution by Features of the Present Invention:

The invention has the structures of amended claim 1 to thereby increase the recording density by improving the S/N ratio in high density recording without causing an increase in DC noise and degradation in thermal stability, as taught at page 4, line 22 through page 5, line 7 and page 13, lines 5-9 from the bottom of the original specification. Namely, the structure comprises:

(1) a substrate,

(2) a soft magnetic layer of a material selected from a group consisting of an Fe-based material and a Co-based material on said substrate,

(3) a ferromagnetic layer on said soft magnetic layer, having a granular structure, and comprising crystal gains mainly made of cobalt (Co) and grain boundary portions mainly made of a material selected from a group consisting of an oxide, silicon (Si), and an oxide of silicon (Si), and

(4) a layer, on said ferromagnetic layer, comprising a material selected from a group consisting of CoCrPt, CoPt, CoPd, FePt, $CoPt_3$, and $CoPd_3$, the content of the silicon (Si) in said ferromagnetic layer being 6at% or more.

Comparison of the present invention with Kikitsu et al:

Kikitsu et al neither discloses nor suggests the problem that, when aiming at a medium adaptable to 400Gbit/inch^2 or more, makes it difficult to produce such medium that is excellent in thermal stability or recording properties only by adding the oxide such as SiO_2.

In order to solve the problem, in a combination of three layers, specifically as recited in claim 1, the substrate has formed thereon: "the soft magnetic layer of a material selected from a group consisting of an Fe-based material and a Co-based material", "the ferromagnetic layer", and "the layer comprising a material selected from a group consisting of CoCrPt, CoPt, CoPd, FePt, $CoPt_3$, and $CoPd_3$", the content of the silicon (Si) in the ferromagnetic layer is 6at% or more in the amended claims 1 and 6.

Kikitsu et al neither discloses nor suggests a combination of the soft magnetic layer of a material selected from a group consisting of an Fe-based material and a Co-based material and the content of the silicon (Si) in the ferromagnetic layer being 6at% or more, as specified in amended claim 1.

In the absence of any teaching or suggestion of these limitations individually and in combination as recited in the claim, Applicants respectfully submit that amended claim 1 is patentable.

Claim 5

The Examiner asserts that Kikitsu et al. `364 discloses in Paragraph 132 a spacer layer between the functional layer and the recording layer. However, this claim would be patentable for reasons given for parent claim 1. Further, Kikitsu et al does not disclose the combination in claim 1 with "a material selected from a group consisting of CoCrPt, CoPt, CoPd, FePt, $CoPt_3$, and $CoPd_3$."

Claim Rejections - 35 USC § 103

Claims 3, 4, 6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kikitsu et al. (US 2003/0017364). This rejection is traversed for at least the following reasons.

Claim 3

With regard to claim 3, the rejection is moot in view of the cancellation of the claim.

Claim 4

As to claim 4, the claim would be patentable for reasons given for parent claim 1.

Claim 6

As to amended claim 6, the claim would be patentable for the reasons given for amended claim 1 as it includes the combination of layers recited in claim 1 and not taught in Kikitsu.

Claim 9

As to Claim 9, the claim would be patentable for the reasons given for amended claim 1.

New Claims

New claim 10, which depends on amended claims 1 and 5, would be patentable for the reasons given for the amended parent claims.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

/Alan J. Kasper/

Alan J. Kasper
Registration No. 25,426

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE
23373
CUSTOMER NUMBER

Date: July 11, 2008